The Ohio State University at Lima

Undergraduate Research Forum

Presentations

April 27–29, 2011

12:30pm, Reed 160

Poster Session

May 2, 2011

12:30pm, Library

Undergraduate Research Forum

Purpose

The Lima Campus Undergraduate Research Forum is designed to encourage students to actively engage in research. Beyond the Lima Campus Forum, participation in the Denman Undergraduate Research Forum, the University Libraries Undergraduate Research Prize, or publication in JUROS are all strongly encouraged, although faculty and students are welcome to pursue any appropriate forum for their discipline that will showcase undergraduate research.

Thank You

We would like to thank Dean John Snyder for his support of this Forum. Thanks also to the support given by the Lima Campus IT department, maintenance department, and Lima Campus Student Senate.

Faculty Judges

Psychology: Patrick Carroll, Fabio Leite

Biology: Beth Gray, Susan Heaphy, Mark Kleffner

English: Kelly Anspaugh, James Werchan

History: William Angel, Roger Nimps

The student body will also be able to judge the posters from May 2–May 6. Presenters will be in the library at 12:30pm on May 2 to discuss their research. Ballots are available in the library during this time. The first, second, and third prizes will be awarded at the Ohio State University at Lima Awards Ceremony on June 3, 2011.

Oral Presentations Schedule

April 27: Psychology

12:30pm	Sarah Helton
12:45pm	Eric Mohler
1:00pm	Ashley Holtzapple

April 28: Biology

12:30pm	Jacob Sawmiller
12:45pm	Lori Osterloh
1:00pm	Megan Rutledge
1:15pm	Samantha Kramer

April 29: Biology, Humanities

12:30pm	Luke Krohn
12:45pm	Jessica Heinemeier
1:00pm	Kyle Blackston
1:15pm	Alexis Alberts and Ariane Billing
1:30pm	Brian Campbell

Abstracts

Sarah Helton
Faculty Sponsor: Dr. Virginia Tompkins (Psychology)

Mothers' use of rare words and preschoolers' language and literacy skills

Parent-child language interactions are one of the most influential forces in preschoolers' vocabulary development. Several researchers have found a positive relationship between the number of rare words mothers use in conversations with children and children's vocabulary. However, researchers have not examined how mothers' use of rare words is related to other aspects of children's language development, such as story comprehension and children's own production of rare words. Thus, the purpose of this study was to examine mothers' use of rare words in relation to children's vocabulary, story comprehension, and rare word production. I hypothesized that mothers' use of rare words would be related not only to children's vocabulary, but also to their story comprehension and production of rare words. To examine these relationships, I conducted secondary data analysis on mother-child conversations in three contexts: past event talk, wordless book narration, and toy play. In each context, I calculated the number of rare words used by mothers. I plan to examine mothers' use of rare words in relation to children's vocabulary, story comprehension, and children's production of rare words. Understanding how parent-child interactions are related to preschoolers' vocabulary has practical implications considering the relationship between preschoolers' language ability and later literacy skills.

Abstracts

Eric Mohler
Faculty Sponsor: Dr. Joseph Green (Psychology)

The value of an author's work: does it pay to be dead?

It is commonly believed that the value of a piece of art increases upon the death of the artist. In an attempt to examine this so-called "death effect," we presented a short story to *N*=431 undergraduate students attending The Ohio State University at Lima and collected ratings on the amount of money they would hypothetically be willing to spend to purchase a signed, original copy of the work. We experimentally manipulated two pieces of information provided to participants: 1) whether the author died (or moved) after completing the work; and, 2) the gender of the author. Participants randomly received one of the four possible informational conditions used in this study. We hypothesized that the belief that the author was dead would result in a higher price paid for the work. Given the prevalence of gender bias in our society, we also hypothesized that participants would associate a higher value of worth to the work of a male versus female author. Data is currently being analyzed and results are forthcoming.

Abstracts

Ashley Holtzapple
Faculty Sponsor: Dr. Joseph Green (Psychology)

Examining gender-biased press coverage of high school basketball: a followup investigation

A previous, preliminary study suggested gender bias in the coverage of local high school basketball games. McKinley, Holtzapple, and Green (2010) reported that *The Lima News* and *Kenton Times* were more apt to provide lengthy coverage of local boys' games compared to girls' games. Unlike the original study that examined only one year of press coverage from each paper, the present investigation tabulated data across four separate years within the last decade. In addition to the overall length of article, the present study examined the likelihood of a picture accompanying the article and how prominently the article was featured on the page. Data is currently being analyzed. By comparing and contrasting the length of articles and other related variables associated with boys' and girls' games, our results will reflect the extent to which gender bias exists within our local media coverage of high school sports.

Abstracts

Jacob Sawmiller
Faculty Sponsor: Dr. Jacqueline Augustine (Biology)

The effect of quantity and food type on an individual's foraging decisions

Animals make decisions about where to forage based on several factors such as food availability, nutrient quality, handling time, food distribution, and quantity. Most previous research focused on the feeding habits of a single species, so we decided to examine the feeding habits of a community of birds. We hypothesized that the birds would choose large piles due to reduced handling time and seed piles due to nutrient content. To test this, we offered the birds two types of food (sunflower seeds and mealworms) in two noticeably different quantities at two different locations on the OSU-Lima campus. The large piles consisted of 100 worms or 100 seeds and the small piles consisted of 25 worms or 25 seeds. An observer recorded the species of every bird that chose a platform and which platform the bird chose during a one hour period. We observed 819 individuals over a period of 10 hours, including Carolina Chickadees (*Poecile carolinensis*), White-breasted Nuthatches (*Sitta carolinensis*), Tufted Titmice (*Baeolophus bicolor*), and House Finches (*Carpodacus mexicanus*). Birds selected large piles and seed piles, supporting our hypothesis. This conclusion is consistent with previous studies, but future research could examine the effects of intraspecific competition on songbird feeding habits.

Abstracts

Lori Osterloh
Faculty Sponsor: Dr. Jacqueline Augustine (Biology)

Effects of black walnut (*Juglans nigra*) extract on monocots

Allelopathy describes the process where the chemical constituents produced by one plant hinder the growth of another. Black walnut trees (*Juglans nigra*) synthesize juglone, an allelopathic chemical, and display few companion plants under their canopy areas when observed in nature. We hypothesized that the addition of black walnut extract would negatively impact plant germination and growth, according to extract strength. We chose three species that co-occur with black walnut: Kentucky bluegrass (*Poa pratensis*), ryegrass (*Lolium perenne*), and corn (*Zea mays*). We found that increasing concentrations of the extract led to decreased seed germination but varied according to species. The results of the extract on the established grass seedlings were inconclusive. Our hypothesis was supported in the germination portion and not in the established portion. Because black walnut extract decreased seed germination additional research could determine if this naturally-occurring allelochemical could control undesirable or invasive plants. The species not affected by black walnut extract could be suitable as a companion crop in black walnut stands.

Abstracts

Megan Rutledge
Faculty Sponsor: Dr. Jacqueline Augustine (Biology)

The effect of male House Wren mating strategy on offspring, quality and survival rate

Mating strategy affects the overall fitness of male birds via the number of offspring they produce and offspring survival rate. Male House Wrens (*Troglodytes aedon*) exhibit three different types of mating strategies: singled-brooded monogamy, sequential monogamy (two non-overlapping broods), and polygyny (2+ simultaneous broods). Our goal was to determine which mating strategy produces higher overall reproductive success and offspring quality. We studied House Wrens nesting in a wooded property at the Ohio State University at Lima between 1990-1994. Number of eggs, number of nestlings, and identity of color-banded wrens were recorded. Of 166 males, 62% of males were single-brooded, 25% were multi-brooded, and were 13% were polygynous. Mating strategy was consistent for individual males between years. Polygynous males raised more offspring, but monogamous males had the most nestlings recruited to the breeding population in subsequent years. Average weight of nestlings was independent of mating strategy, suggesting that mating strategy does not affect offspring quality but does affect quantity. This study raises the question as to why males exhibit polygyny if their offspring are less likely to recruit to the breeding population. Further research should manipulate food or nesting boxes to determine whether mating strategy is environmentally constrained.

Abstracts

Samantha Kramer
Faculty Sponsor: Dr. Jacqueline Augustine (Biology)

Evaluation of wetland, prairie, and forest habitats using avian diversity

Habitat destruction has negatively affected many species, sparking the need for habitat conservation. Habitat conservation priorities are determined by the number of individuals and the presence of various species. The purpose of this study was to observe birds in prairies, forests, and wetlands in three states, to provide data for habitat conservation. I predict species richness and abundance will be highest in wetlands, while feeding guild diversity will be lowest in prairies. Using mist nets, the numbers and species of captured birds were collected, and abundance, species richness, species diversity, and guild diversity were calculated. Species diversity and richness were higher, but abundance and guild diversity were lower in old growth forest than the other habitats. Because the metrics do not provide a consensus of habitat quality, my hypothesis that wetlands would have highest species richness and abundance was not supported. The results did not agree with previous work finding high species diversity in forests, high abundance in savannas, or high guild diversity in wetlands. Categorizing guilds more specifically, perhaps by foraging patterns, and collecting data multiple times at each site may provide more informative results. This study demonstrates the challenges of prioritizing habitats for biodiversity conservation.

Abstracts

Luke Krohn
Faculty Sponsor: Dr. Jacqueline Augustine (Biology)

House Wren fecundity and nestling visitation rate in natural and altered habitats

Urbanization causes native wildlife to adapt, move, or die due to loss of habitat or food. House Wrens (*Troglodytes aedon*) are small, cavity-nesting, migratory, insectivorous birds found many habitats. We hypothesized that the presence of humans and a disturbed habitat would lead to lower feeding rates, and fewer and smaller nestlings when compared to a natural habitat. We placed fifty wren boxes in a woods bordered by prairie and fifty boxes in a golf course. We checked these boxes every other day from April to August. On the fourth day after hatching, we observed how many times the adults visited the box during a 30 minute period. Overall, 44 nests were attempted at the golf course and 41 at the woods. Wrens laid more eggs and laid earlier at the golf course than in the woods. At four days after hatching, the golf course adults visited the nest box more; however, the number of young fledged was similar in both habitats. Contrary to our hypothesis, the wrens seemed able to adapt to human presence. Future research should monitor a wider variety of habitats to determine the limits of tolerance of House Wrens to human disturbance.

Abstracts

Jessica Heinemeier
Faculty Sponsor: Dr. Eric Juterbock (Biology)

Reliability of using plaster models to measure evaporative water loss of Plethodontid salamanders

Understanding evaporative water loss in amphibians can lead to a better understanding of how their habitats and behaviors influence desiccation. Tracy et al (2007) used plaster models of frogs; I extended this to salamanders. Latex molds were made of preserved *Desmognathus fuscus* of varying sizes. The latex molds were filled with plaster of Paris to create three-dimensional models. Each model soaked in water until it was fully hydrated. The models were dehydrated for eight to nine hours in our dehydration apparatus. This device consisted of a plastic container with chambers that sat on a platform suspended above water. Humidity was controlled by propping open the lid of the dehydration apparatus by varying degrees. Water loss rates of live salamanders overlapped those of modeled salamanders of similar sizes. Models lost significantly more water in 89-92% relative humidity than in 93-95% relative humidity. Larger models lost more water than small models ($p<0.001$) but large models had a significantly slower water loss rate (low:0.006±0.001 g/g/hr; high: 0.005±0.001 g/g/hr) than small models (low: 0.020±0.007 g/g/hr; high: 0.010±0.002 g/g/hr). These models could be useful in field experiments to better understand the risk of desiccation an amphibian faces within different environmental conditions.

Abstracts

Kyle Blackston
Faculty Sponsor: Dr. Beth Sutton-Ramspeck (English)

Vampires as foreigners in literature: Romantics to modernists

Vampires are foreigners to the world itself. They have always been unnatural creatures in some of the most extreme senses imaginable. The mirror of that is also true: books which focus on the theme of foreignness often use vampiric traits to emphasize the differences between foreign and domestic elements. Compiling typical vampire traits and seeing how those traits enhance the foreignness of vampires will establish a background for analyzing similar elements in literature. To establish this connection, a chornological order of short-stories and novels will be examined: John Polidori's *The Vampyre,* Emile and Charlotte Brontë's *Wuthering Heights* and *Jane Eyre* (respectively), Bram Stoker's *Dracula,* and Jean Rhys's *Voyage in the Dark.* The essay focuses on how the vampiric traits are evident in non-vampire novels, and why those specifically foreign traits have been used. Understanding the connection that some characters have with vampires will help in further analysis of novels by providing new insight into said characters.

Abstracts

Alexis Alberts and Ariane Billing
Faculty Sponsor: Mr. Doug Sutton-Ramspeck (English)

Reacculturating high school students: writing expectations in college communities

Kenneth Bruffee, Writing Center theorist, argues that students' transition from high school to college environments can be described as a "reacculturation," which involves "giving up, modifying, or renegotiating [their] language [and] values" (*Collaborative Learning).* The OSU-Lima Writing Center has developed a program to help ease this transition for high school students. Presenting themselves as "knowledgeable peers," tutors enter the high school classrooms and offer stories of their own transitions from high school to college writing. They then provide a sample college assignment that inspires academic discussion among the high school students. During Winter Quarter of 2011, more than 1,400 area high school students participated in these workshops. Undergraduate tutors, Alexis Alberts and Ariane Billing, will provide samples from the actual presentation and will discuss the effectiveness of this outreach program.

Abstracts

Brian Campbell
Faculty Sponsors: Dr. Stanley Blake and Dr. Allison Gilmore (History)

Brigade 2506: young, idealistic, and anti-Castro

My research is a continuation of a History 699 project that I completed last spring. The topic that I am studying is Brigade 2506, the group of Cuban exiles who carried out the Bay of Pigs Invasion. During the course of this year, I have continued to read books pertaining to the Bay of Pigs as well as conducting two interviews with Bay of Pigs veteran Dr. Mario Abril. Dr. Abril revealed that exile participation was largely based on the threat of a Communist government under Fidel Castro. Dr. Abril provided me with a list of Brigade veterans that he believes was compiled by the Bay of Pigs Veteran's Association in Miami. The list provides information about age, profession, and marital status, just to name a few. After analyzing the transcripts from the interviews, the Brigade list, and other materials that I've accumulated in the past year, I conclude that Brigade 2506 was a military unit comprised mostly of young and idealistic men, unhappy with the political situation at the time, and vehemently opposed to Communism. They were not enticed by financial gain but rather motivated by commitment to toppling the Castro regime.

About

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